**? logon**

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*** It is now 2010/08/31 09:35:54 ***
 (Dialog time 2010/08/31 08:35:54)
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**? b 155 biosci medicine 399**

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     $0.00  Estimated cost File415
     $0.06  INTERNET
     $0.06  Estimated cost this search
     $0.08  Estimated total session cost   0.245 DialUnits

SYSTEM:OS  - DIALOG OneSearch
  File 155:MEDLINE(R) 1950-2010/Aug 27
         (c) format only 2010 Dialog
  File   5:Biosis Previews(R) 1926-2010/Aug W4
         (c) 2010 The Thomson Corporation
  File  24:CSA Life Sciences Abstracts 1966-2010/Aug
         (c) 2010 CSA.
  File  28:Oceanic Abstracts 1966-2010/Aug
         (c) 2010 CSA.
  File  34:SciSearch(R) Cited Ref Sci 1990-2010/Aug W4
         (c) 2010 The Thomson Corp
  File  35:Dissertation Abs Online 1861-2010/Jul
         (c) 2010 ProQuest Info&Learning
  File  40:Enviroline(R) 1975-2008/May
         (c) 2008 Congressional Information Service
*File  40: This file is closed and will no longer update. For
similar data, please search File 76-Environmental Sciences.
  File  41:Pollution Abstracts 1966-2010/Aug
         (c) 2010 CSA.
  File  44:Aquatic Science & Fisheries Abstracts 1966-2010/Aug
         (c) 2010 CSA.
  File  45:EMCare 2010/Aug W3
         (c) 2010 Elsevier B.V.
  File  50:CAB Abstracts 1972-2010/Sep W1
         (c) 2010 CAB International
  File  65:Inside Conferences 1993-2010/Aug 27
         (c) 2010 BLDSC all rts. reserv.
  File  71:ELSEVIER BIOBASE 1994-2010/Aug W5
         (c) 2010 Elsevier B.V.
  File  72:EMBASE 1993-2010/Aug 30
         (c) 2010 Elsevier B.V.
  File  73:EMBASE 1974-2010/Aug 30
         (c) 2010 Elsevier B.V.
  File  76:Environmental Sciences 1966-2010/Aug
         (c) 2010 CSA.
  File  98:General Sci Abs 1984-2010/Jul
         (c) 2010 The HW Wilson Co.
  File 110:WasteInfo 1974-2002/Jul
         (c)  2002 AEA Techn Env.
*File 110: This file is closed (no updates)
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         (c) 2010 NewsRx
  File 136:BioEngineering Abstracts 1966-2007/Jan
         (c) 2007 CSA.
*File 136: This file is closed.
  File 144:Pascal 1973-2010/Aug W4
         (c) 2010 INIST/CNRS
  File 164:Allied & Complementary Medicine 1984-2010/Aug
         (c) 2010 BLHCIS
  File 172:EMBASE Alert 2010/Aug 30
         (c) 2010 Elsevier B.V.
  File 185:Zoological Record Online(R) 1864-2010/Sep
         (c) 2010 The Thomson Corp.
  File 357:Derwent Biotech Res. _1982-2010/Jul W2
         (c) 2010 Thomson Reuters
  File 369:NEW SCIENTIST 1994-2010/JAN W5
         (c) 2010 REED BUSINESS INFORMATION LTD.
*File 369: This file is closed and will no longer update.
  File 370:Science 1996-1999/Jul W3
         (c) 1999 AAAS
*File 370: This file is closed (no updates). Use File 47 for more
current
information.
  File 391:Beilstein Database - Reactions 2008/Q2
         (c) 2008 Beilstein GmbH
  File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
         (c) 2006 The Thomson Corp
  File 457:The Lancet 1992-2010/Aug W4
         (c) 2010 Elsevier Limited.All rights res
  File 467:ExtraMED(tm) 2000/Dec
         (c) 2001 Informania Ltd.
  File 138:Physical Education Index 1990-2010/Aug
         (c) 2010 CSA.
  File 149:TGG Health&Wellness DB(SM) 1976-2010/Aug W5
         (c) 2010 Gale/Cengage
*File 149: Despite the gap in UDs, the file is complete and
up to date.
  File 156:ToxFile 1965-2010/Aug W4
         (c) format only 2010 Dialog
  File 159:Cancerlit 1975-2002/Oct
         (c) format only 2002 Dialog
  File 162:Global Health 1983-2010/Sep W1
         (c) 2010 CAB International
  File 266:FEDRIP 2010/Jun
         Comp & dist by NTIS, Intl Copyright All Rights Res
  File 399:CA SEARCH(R) 1967-2010/UD=15310
         (c) 2010 American Chemical Society
*File 399: Use is subject to the terms of your user/customer agreement.
IPCR/8 classification codes now searchable as IC=. See HELP NEWSIPCR.
  File 444:New England Journal of Med. 1985-2010/Aug W4
         (c) 2010 Mass. Med. Soc.

      Set  Items  Description
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? **e au=abraham t**

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Ref    Items  Index-term
E1       395 *AU=ABRAHAM T
E2        19  AU=ABRAHAM T A
E3         1  AU=ABRAHAM T C
E4        35  AU=ABRAHAM T E
E5        92  AU=ABRAHAM T EMILIA
E6         8  AU=ABRAHAM T J
E7         2  AU=ABRAHAM T J JR
E8        38  AU=ABRAHAM T JAWAHAR
E9        74  AU=ABRAHAM T K
E10       11  AU=ABRAHAM T L

Enter P or PAGE for more
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? **s e1 or e4 or e5**

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             395  AU=ABRAHAM T
              35  AU=ABRAHAM T E
              92  AU=ABRAHAM T EMILIA
      S1     522  AU='ABRAHAM T' OR AU='ABRAHAM T E' OR AU='ABRAHAM T
                  EMILIA'
```

? **s s1 and crystal?**

Processing

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             522  S1
         5024935  CRYSTAL?
      S2      32  S1 AND CRYSTAL?
```

? **rd**

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>>>Duplicate detection is not supported for File 391.

>>>Records from unsupported files will be retained in the RD set.
      S3      24  RD  (unique items)
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? **s s3/5/all**

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>>>Invalid syntax
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? **t s3/5/all**

**Dialog eLink:** USPTO Full Text Retrieval Options

3/5/1 (Item 1 from file: 155)
DIALOG(R)File 155: MEDLINE(R)


16629234 **PMID:** 15967371

**Biosensor for the determination of phenols based on cross-linked enzyme crystals (CLEC) of laccase.**

Roy J Jegan; Abraham T Emilia; Abhijith K S; Kumar P V Sujith; Thakur M S
Bioactive Polymer Engineering Section, Polymer Science Division, Regional Research

Laboratory (CSIR), Trivandrum 695019, India.
Biosensors & bioelectronics ( England ) Jul 15 2005 , 21 (1) p206-11 , **ISSN:** 0956-5663--Print 0956-5663--Linking **Journal Code:** 9001289
Publishing Model Print
**Document type:** Journal Article; Research Support, Non-U.S. Gov't
**Languages:** ENGLISH
**Main Citation Owner:** NLM
**Record type:** MEDLINE; Completed
**Subfile:** INDEX MEDICUS
Cross-linked enzyme crystals (CLECs) are a versatile form of biocatalyst that can also be used for biosensor application. Laccase from Trametes versicolor (E.C.1.10.3.2) was crystallized, cross-linked and lyophilized with beta-cyclodextrin. The CLEC laccase was found to be highly active towards phenols like 2-amino phenol, guaiacol, catechol, pyrogallol, catechin and ABTS (non-phenolic). The CLEC laccase was embedded in 30% polyvinylpropylidone (PVP) gel and mounted into an electrode to make the sensor. The biosensor was used to detect the phenols in 50-1000 micromol concentration level. Phenols with lower molecular weight such as 2-amino phenol, catechol and pyrogallol gave a short response time where as the higher molecular weight substrates like catechin and ABTS had comparatively a long response time. The optimum pH of the analyte was 5.5-6.0 when catechol was used as substrate. The CLEC laccase retained good activity for over 3 months.
**Descriptors:** *Biosensing Techniques--instrumentation--IS; *Laccase; *Phenols--analysis --AN ; Biosensing Techniques--methods--MT; Calibration; Cross-Linking Reagents; Crystallization; Kinetics; Laccase--chemistry--CH; Polyporales--enzymology --EN; Polyvinyls
**CAS Registry No.:** 0 (Cross-Linking Reagents); 0 (Phenols); 0 (Polyvinyls)
**Enzyme No.:** EC 1.10.3.2 (Laccase)
**Record Date Created:** 20050621
**Record Date Completed:** 20080305


3/5/2 (Item 2 from file: 155)
DIALOG(R)File 155: MEDLINE(R)


15028854 **PMID:** 12396133
**Degradation of textile dyes mediated by plant peroxidases.**

Shaffiqu T S; Roy J Jegan; Nair R Aswathi; Abraham T Emilia
Biochemical Processing Section, Regional Research Laboratory (CSIR), Thiruvananthapuram, India.
Applied biochemistry and biotechnology ( United States ) Jul-Dec 2002 , 102-103 (1-6) p315-26 , **ISSN:** 0273-2289--Print 0273-2289--Linking **Journal Code:** 8208561
Publishing Model Print
**Document type:** Journal Article; Research Support, Non-U.S. Gov't

**Languages:** ENGLISH
**Main Citation Owner:** NLM
**Record type:** MEDLINE; Completed
**Subfile:** INDEX MEDICUS; Toxbib
The peroxidase enzyme from the plants Ipomea palmata (1.003 IU/g of leaf) and Saccharum spontaneum (3.6 IU/g of leaf) can be used as an alternative to the commercial source of horseradish and soybean peroxidase enzyme for the decolorization of textile dyes, mainly azo dyes. Eight textiles dyes currently used by the industry and seven other dyes were selected for decolorization studies at 25-200 mg/L levels using these plant enzymes. The enzymes were purified prior to use by ammonium sulfate precipitation, and ion exchange and gel permeation chromatographic techniques. Peroxidase of S. spontaneum leaf (specific activity of 0.23 IU/mg) could completely degrade Supranol Green and Procion Green HE-4BD (100%) dyes within 1 h, whereas Direct Blue, Procion Brilliant Blue H-7G and Chrysoidine were degraded >70% in 1 h. Peroxidase of Ipomea (I. palmata leaf; specific activity of 0.827 U/mg) degraded 50 mg/L of the dyes Methyl Orange (26%), Crystal Violet (36%), and Supranol Green (68%) in 2-4 h and Brilliant Green (54%), Direct Blue (15%), and Chrysoidine (44%) at the 25 mg/L level in 1 to 2 h of treatment. The Saccharum peroxidase was immobilized on a hydrophobic matrix. Four textile dyes, Procion Navy Blue HER, Procion Brilliant Blue H-7G, Procion Green HE-4BD, and Supranol Green, at an initial concentration of 50 mg/L were completely degraded within 8 h by the enzyme immobilized on the modified polyethylene matrix. The immobilized enzyme was used in a batch reactor for the degradation of Procion Green HE-4BD and the reusability was studied for 15 cycles, and the half-life was found to be 60 h.
**Descriptors:** *Coloring Agents--metabolism--ME; *Ipomoea--enzymology--EN; *Peroxidases --metabolism--ME; *Plant Proteins--metabolism--ME; *Saccharum--enzymology --EN ; Azo Compounds--chemistry--CH; Azo Compounds--metabolism--ME; Biodegradation, Environmental; Color; Enzymes, Immobilized--metabolism--ME; Horseradish Peroxidase--metabolism--ME; Hydrogen-Ion Concentration; Peroxidases--chemistry--CH; Plant Proteins--chemistry--CH; Polyethylene --chemistry--CH; Textiles
**CAS Registry No.:** 0 (Azo Compounds); 0 (Coloring Agents); 0 (Enzymes, Immobilized); 0 (Plant Proteins); 9002-88-4 (Polyethylene)
**Enzyme No.:** EC 1.11.1.- (Horseradish Peroxidase); EC 1.11.1.- (Peroxidases)
**Record Date Created:** 20021024
**Record Date Completed:** 20030521


3/5/3 (Item 1 from file: 5)
DIALOG(R)File 5: Biosis Previews(R)


0020077407 **Biosis No.:** 200800124346
**Studies on crystallization and cross-linking of lipase for biocatalysis**

**Author:** Rajan Akhila; Abraham T Emilia (Reprint)

**Author Address:** CSIR, Reg Res Lab, Chem Sci and Technol Div, Trivandrum 695019, Kerala, India**India
**Author E-mail Address:** emiliatea@yahoo.com
**Journal:** Bioprocess and Biosystems Engineering 31 ( 2 ): p 87-94 FEB 2008 2008
**Item Identifier:** doi:10.1007/s00449-007-0149-5
**ISSN:** 1615-7591
**Document Type:** Article
**Record Type:** Abstract
**Language:** English

**Abstract:** The development of robust biocatalysts with increased stability and activity is a major challenge to industry. A major breakthrough in this field was the development of cross-linked enzyme crystals with high specificity and stability. A method is described to produce micro crystals of CLEC lipase, which is thermostable and solvent stable. Lipase from Burkholderia cepacia was crystallized using ammonium sulfate and cross-linked with glutaraldehyde to produce catalytically active enzyme. The maximum yield of CLEC was obtained with 70% ammonium sulfate and cross-linked with 5% (v/v) glutaraldehyde. SEM studies showed small hexagonal-shaped crystals of 2-5 mu m size. CLEC lipase had improved thermal and reuse stability. It is versatile, having good activity in both polar and nonpolar organic solvents. CLEC lipase was coated using beta cyclodextrin for improving the storage and reuse stability. CLEC was successfully used for esterification of Ibuprofen and synthesis of ethyl butyrate.

**Registry Numbers:** 111-30-8: glutaraldehyde; 7585-39-9: beta-cyclodextrin; 7783-20-2: ammonium sulfate; 9001-62-1: lipase; 105-54-4: ethyl butyrate
**Enzyme Commission Number:** EC 3.1.1.3: lipase
**DESCRIPTORS:**
**Major Concepts:** Methods and Techniques; Enzymology--Biochemistry and Molecular Biophysics
**Biosystematic Names:** Pseudomonadaceae--Gram-Negative Aerobic Rods and Cocci, Eubacteria, Bacteria, Microorganisms
**Organisms:** Burkholderia cepacia (Pseudomonadaceae)
**Common Taxonomic Terms:** Bacteria; Eubacteria; Microorganisms
**Chemicals & Biochemicals:** glutaraldehyde; beta-cyclodextrin; ammonium sulfate; lipase; ethyl butyrate
**Methods & Equipment:** enzyme crystallization--laboratory techniques
**Miscellaneous Terms: Concept Codes:** biocatalysis
**Concept Codes:**
10060 Biochemistry studies - General
10068 Biochemistry studies - Carbohydrates
10802 Enzymes - General and comparative studies: coenzymes
31000 Physiology and biochemistry of bacteria
**Biosystematic Codes:**
06508 Pseudomonadaceae

3/5/4 (Item 2 from file: 5)
DIALOG(R)File 5: Biosis Previews(R)


0019862522 **Biosis No.:** 200700522263

# Physico-chemical characterization of starch ferulates of different degrees of substitution

**Author:** Mathew Sindhu; Abraham T Emilia (Reprint)
**Author Address:** CSIR, Reg Res Lab, Chem Sci and Technol Div, Trivandrum 695019, Kerala, India**India
**Author E-mail Address:** emiliatea@yahoo.com
**Journal:** Food Chemistry 105 ( 2 ): p 579-589 2007 2007
**Item Identifier:** doi:10.1016/j.foodchem.2007.04.032
**ISSN:** 0308-8146
**Document Type:** Article
**Record Type:** Abstract
**Language:** English

**Abstract:** Starch ferulates were prepared by reacting potato starch with ferulic acid chloride, using pyridine as a catalyst in dimethyl sulfoxide. Starch ferulates of different degrees of substitution (DS) were prepared and their formation was confirmed by the presence of the carbonyl signal around 1726 cm(-1) in the FT-IR spectra. The thermal characteristics of the native starch and starch ferulates of different degrees of substitution were studied using TGA, DTG and DSC and the studies revealed the starch ferulates to be thermally more stable than the native starch. The starch esters exhibited 50% weight loss at temperatures from 332 to 375 degrees C while the native starch underwent 50% weight loss at 321 degrees C. The H-1 and C-13 NMR studies confirmed the structure of the modified starch. X-ray diffraction studies revealed the loss of the ordered B-type crystalline structure, characteristic of potato starch. The microstructural imaging of the starch esters exhibited a networking which was enhanced with increasing degree of substitution. The starch ferulates also exhibited DPPH radical and ABTS radical cation-scavenging activity. (c) 2007 Elsevier Ltd. All rights reserved.

**Registry Numbers:** 67-68-5: DMSO; 110-86-1: pyridine
**DESCRIPTORS:**
**Major Concepts:** Biochemistry and Molecular Biophysics; Foods
**Biosystematic Names:** Solanaceae--Dicotyledones, Angiospermae, Spermatophyta, Plantae
**Organisms:** potato (Solanaceae)
**Common Taxonomic Terms:** Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants
**Chemicals & Biochemicals:** DMSO; carbonyl; pyridine; starch ferulate; ferulic acid chloride
**Miscellaneous Terms: Concept Codes:** potato--vegetable; physico-chemical

characterization; differential degree substitution
**Concept Codes:**
10060 Biochemistry studies - General
13502 Food technology - General and methods
13504 Food technology - Fruits, nuts and vegetables
51522 Plant physiology - Chemical constituents
**Biosystematic Codes:**
26775 Solanaceae


3/5/5 (Item 3 from file: 5)
DIALOG(R)File 5: Biosis Previews(R)


0019468536 **Biosis No.:** 200700128277
**Continuous biotransformation of pyrogallol to purpurogallin using cross-linked enzyme crystals of laccase as catalyst in a packed-bed reactor**

**Author:** Roy J Jegan; Abraham T Emilia (Reprint)
**Author Address:** CSIR, Reg Res Lab, Div Chem Sci, Trivandrum 695019, Kerala, India**India
**Author E-mail Address:** emiliatea@yahoo.com
**Journal:** Journal of Chemical Technology and Biotechnology 81 ( 11 ): p 1836-1839 NOV 2006 2006
**ISSN:** 0268-2575
**Document Type:** Article
**Record Type:** Abstract
**Language:** English

**Abstract:** Cross-linked enzyme crystals (CLEC) of laccase were prepared by crystallizing laccase with 75% (NH4)(2)SO4 and cross-linking using 1.5% glutaraldehyde. The cross-linked enzyme crystals were further coated with 1 mmol L-1 beta-cyclodextrin by lyophilization. The lyophilized enzyme crystals were used as such for the biotransformation of pyrogallol to purpurogallin in a packed-bed reactor. The maximum conversion (76.28%) was obtained with 3 mmol L-1 pyrogallol at a residence time of 7.1 s. The maximum productivity (269.03 g L-1 h(-1)) of purpurogallin was obtained with 5 mmol L-1 pyrogallol at a residence time of 3.5 s. The productivity was found to be 261.14 g L-1 h(-1) and 251.1 g L-1 h(-1) when concentrations of 3 mmol L-1 and 7 mmol L-1 respectively were used. The reaction rate of purpurogallin synthesis was maximum (2241.94 mg purpurogallin mg(-1) CLEC h(-1)) at a residence time of 3.5 s, when 5 mmol L` pyrogallol was used as the substrate. The catalyst to product ratio calculated for the present biotransformation was 1:2241. The CLEC laccase had very high stability in reuse and even after 650 h of continuous use, the enzyme did not lose its activity. (c) 2006 Society of Chemical Industry.

**Registry Numbers:** 111-30-8: glutaraldehyde; 7585-39-9: beta-cyclodextrin; 7783-20-2: ammonium sulfate; 87-66-1: pyrogallol; 569-77-7: purpurogallin; 80498-15-3: laccase
**DESCRIPTORS:**
**Major Concepts:** Bioprocess Engineering
**Chemicals & Biochemicals:** glutaraldehyde; beta-cyclodextrin; ammonium sulfate; pyrogallol; purpurogallin; laccase
**Miscellaneous Terms: Concept Codes:** packed-bed reactor
**Concept Codes:**
10060 Biochemistry studies - General
10068 Biochemistry studies - Carbohydrates
10802 Enzymes - General and comparative studies: coenzymes
39008 Food microbiology - General and miscellaneous


3/5/6 (Item 4 from file: 5)
DIALOG(R)File 5: Biosis Previews(R)


18921143 **Biosis No.:** 200600266538
**Preparation and characterization of cross-linked enzyme crystals of laccase**

**Author:** Roy J Jegan; Abraham T Emilia (Reprint)
**Author Address:** CSIR, Reg Res Lab, Div Chem Sci, Trivandrum 695019, Kerala, India**India
**Author E-mail Address:** einiliatea@yahoo.com
**Journal:** Journal of Molecular Catalysis B Enzymatic 38 ( 1 ): p 31-36 JAN 2 2006 2006
**ISSN:** 1381-1177
**Document Type:** Article
**Record Type:** Abstract
**Language:** English

**Abstract:** Laccase from Trametes versicolor was crystallized using ammonium sulphate and the resultant crystals on cross-linking with glutaraldehyde produced insoluble and catalytically active enzyme. These cross-linked enzyme crystals (CLEC) of laccase had improved thermal stability (fourfold) than the native enzyme. The half-life of CLEC laccase at 60 degrees C was 123 min compared to 24 min for the soluble enzyme. The kinetics of oxidation reactions catalyzed by CLEC laccase was studied using various substrates 2,2'-azino-bis(3-ethylbenz-thiazoline-6-sulphonic acid) (ABTS), guaiacol, catechol, pyrogallol, syringaldazine and catechin. ABTS was found to be the best substrate for CLEC laccase (K-m = 0.859 mM) and had a catalytic efficiency (k(cat)/K-m = 3.73 x 10(3)) higher than the other substrates. The CLEC laccase showed lower specific activity, V-max and k(cat) values than the native enzyme for all the substrate studied and this may be due to the partial inactivation of laccase crystals by glutaraldehyde, and also the diffusion limitation of the substrate through the channels in the cross-linked crystal

structure of laccase enzyme. CLEC laccase had a higher activity in non-polar organic solvents like hexane, toluene, isooctane and cyclohexane. The preparation and characterization of CLEC laccase is reported for the first time. 

**Registry Numbers:** 111-30-8: glutaraldehyde; 7783-20-2: ammonium sulfate; 154-23-4: catechol; 110-54-3: hexane; 108-88-3: toluene; 80498-15-3: laccase; 90-05-1: guaiacol ; 87-66-1: pyrogallol; 14414-32-5: syringaldazine; 100786-01-4: catechin; 26635-64-3: isooctane; 110-82-7: cyclohexane
**Enzyme Commission Number:** EC 1.10.3.2: laccase
**DESCRIPTORS:**
**Major Concepts:** Enzymology--Biochemistry and Molecular Biophysics; Bioprocess Engineering
**Biosystematic Names:** Basidiomycetes--Fungi, Plantae
**Organisms:** Trametes versicolor (Basidiomycetes)
**Common Taxonomic Terms:** Fungi; Microorganisms; Nonvascular Plants; Plants
**Chemicals & Biochemicals:** glutaraldehyde; ammonium sulfate; catechol--substrate; hexane--organic solvent; toluene--organic solvent; laccase--oxidation, catalysis, crystallization, kinetics, half-life; 2,2'-azino-bis(3-ethylbenz-thiazoline-6-sulphonic acid) {ABTS}--substrate; guaiacol--substrate; pyrogallol--substrate; syringaldazine--substrate; catechin--substrate; isooctane--organic solvent; cyclohexane--organic solvent
**Methods & Equipment:** enzyme crystal cross-linking--laboratory techniques
**Miscellaneous Terms: Concept Codes:** thermal stability
**Concept Codes:**
10060 Biochemistry studies - General
10802 Enzymes - General and comparative studies: coenzymes
39008 Food microbiology - General and miscellaneous
51518 Plant physiology - Enzymes
**Biosystematic Codes:**
15300 Basidiomycetes


3/5/7 (Item 5 from file: 5)
DIALOG(R)File 5: Biosis Previews(R)


11839449 **Biosis No.:** 199396003865
**Stabilization of paste viscosity of cassava starch by heat moisture treatment**

**Author:** Abraham T Emilia
**Author Address:** Fermentation Sect., Regional Res. Lab., Trivandrum, Kerala, India 659019, india**india
**Journal:** Starch 45 ( 4 ): p 131-135 1993
**ISSN:** 0038-9056
**Document Type:** Article

**Record Type:** Abstract
**Language:** English

**Abstract:** Cassava starch has poor paste stability during prolonged cooking. The starch was modified by heat moisture treatment. A premoistured starch (18-24% moisture) was subjected to heat treatment for 3-16 h to bring about paste stability. Different types of heat treatments like moist pressure heating, dry heating and microwave heating was tried. The optimum heat treatment to bring about the paste stability was found to be 18-21% premoistured starch, which was heated at 110 degree C per 16 h. The modified starch granules were intact and had comparatively increased sedimentation volume, oil binding capacity, amylase susceptibility, and decreased crystallinity, water binding capacity, solubility and paste translucency. The freeze- thaw stability was excellent with modified cassava starch. Pie filling and "Halwa" (an Indian sweetmeat) made from modified cassava starch had good organoleptic properties.

**Registry Numbers:** 9005-25-8: STARCH
**DESCRIPTORS:**
**Major Concepts:** Anthropology; Biochemistry and Molecular Biophysics; Foods
**Biosystematic Names:** Euphorbiaceae--Dicotyledones, Angiospermae, Spermatophyta, Plantae; Plantae --Plantae
**Organisms:** Euphorbiaceae (Euphorbiaceae); plant (Plantae)
**Common Taxonomic Terms:** Angiosperms; Dicots; Spermatophytes; Vascular Plants; Plants
**Chemicals & Biochemicals:** STARCH
**Miscellaneous Terms: Concept Codes:** food industry; COOKING TEMPERATURE; ETHNIC FOOD; FOOD CHEMISTRY; HALWA; ORGANOLEPTIC PROPERTIES; PIE FILLING; STARCH
**Concept Codes:**
05000 Physical anthropology and ethnobiology
10068 Biochemistry studies - Carbohydrates
10618 External effects - Temperature as a primary variable - hot
13502 Food technology - General and methods
13516 Food technology - Meats and meat by-products
13530 Food technology - Evaluations of physical and chemical properties
13532 Food technology - Preparation, processing and storage
20001 Sense organs - General and methods
**Biosystematic Codes:**
26055 Euphorbiaceae
11000 Plantae


3/5/8 (Item 1 from file: 34)
DIALOG(R)File 34: SciSearch(R) Cited Ref Sci

20363351 **Genuine Article#:** 566DR **Number of References:** 44
**Title: Localization of DNA and RNA in Eosinophil Secretory Granules**
**Author:** Behzad AR; Walker DC; Abraham T; McDonough J; Mahmudi-Azer S; Chu F; Shaheen F; Hogg JC; Pare PD (REPRINT)
**Author Email Address:** ppare@mrl.ubc.ca
**Corporate Source:** St Pauls Hosp,James Hogg iCAPTURE Ctr Cardiovasc & Pulm Res,Burrard Bldg,Room 166,1081 Burrard St/Vancouver/BC V6Z 1Y6/Canada/ (REPRINT); Univ British Columbia,St Pauls Hosp, Dept Med, James Hogg iCAPTURE Ctr,Vancouver/BC V5Z 1M9/Canada/; Univ British Columbia,St Pauls Hosp, Dept Pathol, James Hogg iCAPTURE Ctr,Vancouver/BC V5Z 1M9/Canada/
**Journal:** INTERNATIONAL ARCHIVES OF ALLERGY AND IMMUNOLOGY , 2010 , V 152 , N1 , P 12-27
**ISSN:** 1018-2438 **Publication Date:** 20100000
**Digital Object Identifier:** 10.1159/000260079
**Publisher:** KARGER , ALLSCHWILERSTRASSE 10, CH-4009 BASEL, SWITZERLAND
**Language:** English **Document Type:** ARTICLE
**Geographic Location:** Canada
**Journal Subject Category:** ALLERGY; IMMUNOLOGY
**Abstract:** Background: Although the accepted paradigm is that the proteins stored in eosinophil crystalloid granules are translated from messenger RNA transcribed in the cell nucleus, recent ultrastructural evidence suggests that protein synthesis may also take place within eosinophilic granules. Methods: We used 2 different methods to detect the presence of DNA and RNA in eosinophil secretory granules. Using bromodeoxyuridine, a thymidine analogue, and bromouridine, a uracil analogue, we labeled the DNA and RNA in eosinophils in vivo in rabbits. Immunoelectron microscopy to localize these molecules was performed on ultrathin sections of blood and bone marrow eosinophils using monoclonal anti-bromodeoxyuridine antibody with IgG as a control. The immunogold grain density was measured in each subcellular compartment within the eosinophils and analyzed using image analysis software. A combination of DNA/CD63 immunofluorescence staining and a fluorescently labeled molecular probe that stains RNA was used to examine the presence of DNA and RNA in the secretory granules of human blood eosinophils. Results: The mean density of bromodeoxyuridine-labeled DNA and bromouridine-labeled RNA immunogold grains in the secretory granules of blood and bone marrow eosinophils were significantly higher ($p < 0.0005$) than cytoplasmic or background staining. We also demonstrated the existence of DNA and RNA in the CD63-positive secretory granules of human peripheral blood eosinophils by means of immunofluorescent staining and a fluorescently labeled molecular probe. Conclusions: These results provide evidence that eosinophil granules are the site of DNA and RNA synthesis and suggest the potential for a new role(s) for eosinophil-secretory granules.

**Descriptors:** SCIAuthor Keywords: Bromodeoxyuridine ; Bromouridine ; Immunogold staining ; SYTO RNA-select fluorescent dye
**Identifiers:** KeyWord Plus(R): MAST-CELL GRANULES; ULTRASTRUCTURAL ANALYSIS; BOND FORMATION; TRANSCRIPTION; RIBONUCLEASE;

RELEASE; BIOLOGY; LEUKOCYTE; NUCLEUS; PROTEIN

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3/5/9 (Item 2 from file: 34)
DIALOG(R)File 34: SciSearch(R) Cited Ref Sci


17760733 **Genuine Article#:** 295BY **Number of References:** 49
**Title: Thermomechanical and rheological properties of high-molecular-weight poly(ethylene oxide)/novolac blends**
**Author:** Ratna D (REPRINT) ; Abraham T; Karger-Kocsis J
**Corporate Source:** Tech Univ Kaiserslautern,Inst Verbundwerkstoffe GmbH,Erwin Schrondinger Str 58/D-67663 Kaiserslautern//Germany/ (REPRINT); Tech Univ Kaiserslautern,Inst Verbundwerkstoffe GmbH,D-67663 Kaiserslautern//Germany/ ; Tech Univ Kaiserslautern,Inst Composite Mat,D-67663 Kaiserslautern//Germany/; Naval Mat Res Lab,Ambernath 421506//India/
**Journal:** MACROMOLECULAR CHEMISTRY AND PHYSICS , 2008 , V 209 , N7 ( APR 4 ) , P 723-733
**ISSN:** 1022-1352 **Publication Date:** 20080404
**Publisher:** WILEY-V C H VERLAG GMBH , PO BOX 10 11 61, D-69451 WEINHEIM, GERMANY
**Language:** English **Document Type:** ARTICLE
**Geographic Location:** Germany; India
**Journal Subject Category:** POLYMER SCIENCE
**Abstract:** Blends of poly(ethylene oxide) (PEO) and novolac-type phenolic resin were investigated for potential use as a crystallizable switching component for shape-memory polymer systems with adjustable switching temperature. High-molecular-weight PEO and novolac blends with low novolac content were studied. Dynamic and isothermal DSC studies indicated a significant decrease in the crystallization temperature as a result of incorporation of novolac. We investigated the spherulitic morphology using a cross-polarized optical microscopy and found a decrease in size and regularity of the spherulites with increasing novolac content. The rheological and mechanical properties corroborated the existence of strong interactions through H-bonding in the amorphous phase.
**Descriptors:** SCIAuthor Keywords: blends ; differential scanning calorimetry (DSC) ; novolac ; optical microscopy ; poly(ethylene oxide) ; shape memory polymers
**Identifiers:** KeyWord Plus(R): SHAPE-MEMORY POLYMERS; MECHANICAL-PROPERTIES; METHACRYLATE) BLENDS; MELTING BEHAVIOR; COPOLYMER BLENDS; THERMAL-BEHAVIOR; EPOXY-RESIN; OXIDE); NANOCOMPOSITES; CRYSTALLIZATION
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3/5/10 (Item 3 from file: 34)
DIALOG(R)File 34: SciSearch(R) Cited Ref Sci


16957772 **Genuine Article#:** 214EY **Number of References:** 24
**Title: Oil distribution in iPP/EPDM thermoplastic vulcanizates**
**Author:** Abraham T; Barber NG; Mallamaci MP
**Journal:** RUBBER CHEMISTRY AND TECHNOLOGY , 2007 , V 80 , N2 ( MAY-JUN ) , P 324-339
**ISSN:** 0035-9475 **Publication Date:** 20070500
**Publisher:** AMER CHEMICAL SOC INC , RUBBER DIV UNIV AKRON PO BOX 499, AKRON, OH 44309-0499 USA
**Language:** English **Document Type:** ARTICLE
**Journal Subject Category:** POLYMER SCIENCE
**Abstract:** Scanning Probe Microscopy (SPM) was used to determine the volume fraction of oil-swollen particulate rubber and oil-swollen plastic in thermoplastic vulcanizates (TPVs) produced from iPP and EPDM rubber. Sample preparation and SPM imaging conditions allowed the ratio of the rubber and plastic area imaged for a TPV sample to be equated to the phase volume ratio. The hydrosilylation cured TPVs contained no filler or inorganic components (other than about 1 ppm of platinum catalyst, based on dry rubber) that would decrease the accuracy of the SPM analysis. The accuracy of the SPM method used for TPV phase volume determination was established by analysis of an oil-free TPV of known composition. The densities of the individual TPV components (rubber, oil, crystalline and amorphous plastic phase), which were assumed to be additive in the composite, were used to calculate the oil distribution between the TPV rubber and plastic phase, since the volumes of the individual components (the extent of plastic crystallinity was measured by differential scanning calorimetry) were known.

Thus, the amount of oil in the oil-swollen TPV rubber and plastic phase could be quantified. This information, coupled with the Tg of the oil-swollen amorphous plastic phase, indicated that a substantial amount of oil was present as a separate oil phase that is surrounded by the oil-swollen amorphous plastic phase. To date, it has been assumed that the oil in a TPV partitions between the rubber and amorphous plastic phase, with the plastic crystallites being oil free. This work is the first demonstration of the presence of a separate oil phase in TPVs, and the first accurate determination of the oil content in the oil-swollen rubber, miscible oil in the oil-swollen amorphous plastic. and the free oil in TPVs.
**Identifiers:** KeyWord Plus(R): ISOTACTIC POLYPROPYLENE; ELASTOMER BLENDS; POLYETHYLENE; COPOLYMER
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3/5/11 (Item 4 from file: 34)
DIALOG(R)File 34: SciSearch(R) Cited Ref Sci


16215136 **Genuine Article#:** 143PP **Number of References:** 29
**Title: Neutron diffraction study of Pseudomonas aeruginosa lipopolysaccharide bilayers**
**Author:** Abraham T (REPRINT) ; Schooling SR; Nieh MP; Kucerka N; Beveridge TJ; Katsaras J
**Corporate Source:** Natl Res Council Canada,Canadian Neutron Beam Ctr,Chalk River/ON K0J 1J0/Canada/ (REPRINT); Natl Res Council Canada,Canadian Neutron Beam Ctr,Chalk River/ON K0J 1J0/Canada/; Univ Guelph,Dept Mol & Cellular Biol,Guelph/ON N1G 2W1/Canada/; Univ Guelph,Biophys Interdept Grp,Guelph/ON N1G 2W1/Canada/; Univ Guelph,Guelph Waterloo Phys Inst,Guelph/ON N1G 2W1/Canada/; Networks Ctr Excellence,Adv Food & Mat Network,Guelph/ON N1G 2W1/Canada/; Brock Univ,Dept Phys,St Catharines/ON L2S 3A1/Canada/
**Journal:** JOURNAL OF PHYSICAL CHEMISTRY B , 2007 , V 111 , N10 ( MAR 15 ) , P 2477-2483
**ISSN:** 1520-6106 **Publication Date:** 20070315

**Publisher:** AMER CHEMICAL SOC , 1155 16TH ST, NW, WASHINGTON, DC 20036 USA
**Language:** English **Document Type:** ARTICLE
**Geographic Location:** Canada
**Journal Subject Category:** CHEMISTRY, PHYSICAL
**Abstract:** Lipopolysaccharides (LPSs) are a major class of macromolecules populating the surface of Gram-negative bacteria. They contribute significantly to the bacterium's surface properties and play a crucial role in regulating the permeability of its outer membrane. Here, we report on neutron diffraction studies performed on aligned, self-assembled bilayers of LPS isolated from Pseudomonas aeruginosa PAO1. This LPS system is comprised of a mixture of rough and smooth A-band and B-band LPS, similar to that naturally found in P. aeruginosa. Temperature scans were conducted at various levels of hydration, and the phases adopted by LPS, along with their corresponding transition temperatures, have been identified. Because of LPS's chemical heterogeneity, the gel-to-liquid-crystalline transition was continuous and not abrupt as commonly observed in single-component phospholipid systems. From the construction of one-dimensional scattering length density profiles, we find that water penetrates into the hydrocarbon region up to and including the center of liquid-crystalline LPS bilayers. This permeability to water also extends to bilayers in the continuous phase transition region and could have far-reaching implications as to how small molecules penetrate the outer membrane of Gram-negative bacteria.
**Identifiers:** KeyWord Plus(R): OUTER-MEMBRANE; X-RAY; SALMONELLA-TYPHIMURIUM; BACTERIAL LIPOPOLYSACCHARIDES; DIVALENT-CATIONS; LIPID-BILAYERS; SEROTYPE O5; PERMEABILITY; CORE; MINNESOTA
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3/5/12 (Item 5 from file: 34)
DIALOG(R)File 34: SciSearch(R) Cited Ref Sci


12807369 **Genuine Article#:** 824CR **Number of References:** 32
**Title: Glycolipid based cubic nanoparticles: preparation and structural aspects**
**Author:** Abraham T (REPRINT) ; Hato M; Hirai M
**Corporate Source:** Univ Alberta,Dept Biochem,3-39 Med Sci Bldg/Edmonton/AB T6G 2H7/Canada/ (REPRINT); Univ Alberta,Dept Biochem,Edmonton/AB T6G 2H7/Canada/; AIST,Nanotechnol Res Inst, Tsukuba Cent 5,Tsukuba/Ibaraki 3058565/Japan/; Gunma Univ,Dept Phys,Maebashi/Gumma 3718510/Japan/
**Journal:** COLLOIDS AND SURFACES B-BIOINTERFACES , 2004 , V 35 , N2 ( MAY 15 ) , P 107-117
**ISSN:** 0927-7765 **Publication Date:** 20040515
**Publisher:** ELSEVIER SCIENCE BV , PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS
**Language:** English **Document Type:** ARTICLE
**Geographic Location:** Canada; Japan
**Journal Subject Category:** BIOPHYSICS; CHEMISTRY, PHYSICAL; MATERIALS SCIENCE, BIOMATERIALS
**Abstract:** Kinetically stable cubic colloidal particle dispersion was produced from a glycolipid using a novel preparation strategy based on the dialysis principle. The use of synchrotron small-angle X-ray diffraction (SSAXD) permitted the identification of exact structure of these dispersed particles in the colloidal state. Dynamic light scattering methods were used to obtain size and size distributions. A glycoside, 1-O-phytanyl-beta-D-xyloside (beta-XP), that exhibits Pn3m cubic phase in an excess aqueous medium, was used as the lipid material. The dialysis technique includes controlled stirring action both inside and outside of the dialysis membrane tube. Initially, a mixed micellar system composed of beta-XP, n-octyl-beta-D-glucopyranoside (beta-OG) and a triblock copolymer, Pluronic F127 (PL) was prepared in the aqueous medium. About 10 wt.% of PL to lipid weight was found to be sufficient to produce stable colloidal dispersions. The mean volume diameter of these colloidal particles was found to be in the range of 0.85 +/- 0.05 mum. The cubic phase structure of these colloidal particles is greatly depended on the final beta-OG concentration level in the system. Coexistence of Im3m and Pn3m

cubic structures has been identified in these colloidal particles. This coexistence has the characteristics of Bonnet relation, which forms a compelling case for the infinite periodic minimal surface (IPMS) descriptions. These colloidal particles could restore pure Pn3m, phase structure, but a longer dialysis time was needed. This work, in general, will open up new possibilities for membrane protein reconstitution and other relevant biological applications using colloidal cubic lipid particles. 

**Descriptors:** SCIAuthor Keywords: lipids ; bicontinuous cubic phases ; membranes ; nanoparticles ; X-ray ; Bonnet transformation

**Identifiers:** KeyWord Plus(R): MEMBRANE-PROTEIN CRYSTALLIZATION; LIPID-WATER PHASES; MESOPHASES; SYSTEMS; BEHAVIOR

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3/5/13 (Item 1 from file: 144)
DIALOG(R)File 144: Pascal

18493078 PASCAL No.: 08-0068273

# Continuous biotransformation of pyrogallol to purpurogallin using cross-linked enzyme crystals of laccase as catalyst in a packed- bed reactor

JEGAN ROY J; ABRAHAM T Emilia
Chemical Sciences Division, Regional Research Laboratory (CSIR), Trivandrum 695 019, India
Journal: Journal of chemical technology and biotechnology : (1986), 2006, 81 ( 11) 1836-1839
ISSN: 0268-2575 CODEN: JCTBDC Availability: INIST-560; 354000143010070150
No. of Refs.: 14 ref.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: United Kingdom
Language: English
Cross-linked enzyme crystals (CLEC) of laccase were prepared by crystallizing laccase with 75% (NH SUB 4 ) SUB 2 SO SUB 4 and cross-linking using 1.5% glutaraldehyde. The cross-linked enzyme crystals were further coated with lmmolL SUP - SUP 1 beta -cyclodextrin by lyophilization. The lyophilized enzyme crystals were used as such for the biotransformation of pyrogallol to purpurogallin in a packed-bed reactor. The maximum conversion (76.28%) was obtained with 3 mmol L SUP - SUP 1 pyrogallol at a residence time of 7.1s. The maximum productivity (269.03 g L SUP - SUP 1 h SUP - SUP 1 ) of purpurogallin was obtained with 5 mmol L SUP - SUP 1 pyrogallol at a residence time of 3.5 s. The productivity was found to be 261.14 g L SUP - SUP 1 h SUP - SUP 1 and 251.1 g L SUP - SUP 1 h SUP - SUP 1 when concentrations of 3 mmolL SUP - SUP 1 and 7 mmolL SUP - SUP 1 respectively were used. The reaction rate of purpurogallin synthesis was maximum (2241.94 mg purpurogallin mg SUP - SUP 1 CLEC h SUP - SUP 1 ) at a residence time of 3.5 s, when 5 mmol L SUP - SUP 1 pyrogallol was used as the substrate. The catalyst to product ratio calculated for the present biotransformation was 1:2241. The CLEC laccase had very high stability in reuse and even after 650 h of continuous use, the enzyme did not lose its

activity.

English Descriptors: Catalyst; Fixed bed reactor; Reaction rate; Kinetics;
Stability; Reuse

French Descriptors: Catalyseur; Reacteur lit fixe; Vitesse reaction;
Cinetique; Stabilite; Reutilisation

Classification Codes: 001D07H; 001C01A03B





3/5/14 (Item 2 from file: 144)
DIALOG(R)File 144: Pascal


13062436 PASCAL No.: 97-0352907

## Markets growing for nanostructured materials

RITTNER M N; ABRAHAM T
Business Communications Co, Norwalk CT, United States
Journal: Materials Technology, 1997
, 12 (2) 70-71

ISSN: 1066-7857 CODEN: MATTEI Availability: E.i.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: United States
Language: English
Nanostructured materials are characterized by highly refined microstructures that distinguish them from conventional polycrystalline materials. These unusual properties are responsible for the growing market in these materials. Nanoparticles are incorporated into commercially-available abrasive polishing slurries, fire retardant materials, magnetic fluids, magnetic recording tapes, sunscreens, and transparent wood stains. By the end of the century, nanostructured materials are expected to play an increasingly significant role in a number of major industries.

English Descriptors: Crystallites; Reviews; Marketing; Crystal microstructure; Particles (particulate matter); Toughness; Powders; Electric conductivity of solids; Strength of materials; Hardness; Magnetic properties; Optical properties; Coercive force; Coatings; Nanostructured materials

French Descriptors: Article synthese; Commercialisation; Microstructure cristalline; Particule(matiere particulaire); Durete tenacite; Poudre; Conductivite electrique solide; Resistance materiau; Durete; Propriete magnetique; Propriete optique; Champ coercitif; Revetement; Nanostructure

Classification Codes: 001B60A50; 001D00D; 001B60A66; 001D14C01; 001B40A; 295



3/5/15 (Item 3 from file: 144)
DIALOG(R)File 144: Pascal


12594898 PASCAL No.: 96-0281860

**Advanced and specialty glasses continue to grow**

ABRAHAM T
Business Communications Co, Inc, Norwalk CT, United States

Journal: Materials Technology, 1996
, 11 (1) 1p

ISSN: 1066-7857 CODEN: MATTEI Availability: E.i.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: United States
Language: English

Both the advanced and specialty glasses play important roles in the telecommunication and electronics industries. For the last two decades, these materials have emerged as one of the newest groups of high technology materials. Several new glass compositions and processing techniques have also been developed to suit the increasing number of applications.

English Descriptors: Biocompatible implants; Ceramic processing; Reviews; Composition; Chemical operations; Ceramic materials; Optical fibers; Liquid crystal displays; Implants (surgical); Dental materials; Composite materials; Sintering; Sol-gels; Comminution; Vapor deposition; Glass

French Descriptors: Article synthese; Composition; Operation chimique; Ceramique; Fibre optique; Affichage cristal liquide; Implant(chirurgie); Produit dentaire; Materiau composite; Frittage; Sol gel; Comminution; Depot phase vapeur; Verre

Classification Codes: 001D08B06C; 001C01; 001D07X; 001D08B04D;
001D03G02C1;
001B40B

Dialog eLink: USPTO Full Text Retrieval Options

3/5/16 (Item 4 from file: 144)
DIALOG(R)File 144: Pascal

11722459 PASCAL No.: 94-0587472

**On the thickness of ferroelastic twin walls in lead phosphate Pb SUB 3 (PO SUB 4 ) SUB 2 a X-ray diffraction study**

WRUCK B; SALJE E K H; ZHANG M; ABRAHAM T; BISMAYER U

Univ. Cambridge, dep. earth sci., Cambridge CB2 3EQ, United Kingdom
Journal: Phase transitions, 1994
, 48 (1-3) 135-148

ISSN: 0141-1594 CODEN: PHTRDP Availability: INIST-18257
; 354000040009400070
No. of Refs.: 22 ref.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: United Kingdom
Language: English

English Descriptors: Experimental study; Thickness; XRD; Crystal twin;
Domain wall; Ferroelastic domain; Lead phosphates; Ternary compounds;
Structure factors
Broad Descriptors: Inorganic compounds; Compose mineral

French Descriptors: Etude experimentale; Epaisseur; XRD; Macle; Paroi
domaine; Domaine ferroelastique; Plomb phosphate; Compose ternaire;
Facteur structure; 6172M; Pb3(PO4)2; O P Pb

Classification Codes: 001B60A72M

Dialog eLink: USPTO Full Text Retrieval Options

3/5/17 (Item 5 from file: 144)
DIALOG(R)File 144: Pascal

11596175 PASCAL No.: 94-0482854

**Analysis and removal of impurities and defects in reactive ion etched silicon using a novel depth-profiling technique**

CHANG W H; HUANG L J; LAU W M; MITCHELL I V; ABRAHAM T; KING M

Surface Science Western and Department of Materials Engineering, University of Western Ontario, London, Ontario N6A 5B7, Canada; Department of Physics, University of Western Ontario, London, Ontario N6A 3K7, Canada; Northern Telecom Electronics Ltd., P.O. Box 3511, Ottawa, Ontario K1Y 4H7, Canada
The 40th National Symposium of the American Vacuum Society (Orlando, Florida (USA)) 1993-11-15/1993-11-19
Journal: Journal of Vacuum Science and Technology A , 1994-07, 12 (4 ) 2357-2362
ISSN: 0734-2101 CODEN: JVTAD6 Availability: INIST-11992A
Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)
Country of Publication: USA
Language: English
The analysis and removal of residual damage induced by reactive ion etching of silicon were studied with a new ultrashallow depth-profiling technique of silicon. In this technique, which is known to give a depth resolution of better than 0.5 nm (Lau et al., Appl. Phys. Lett. 63, 78 (1993)), a few atomic layers of silicon were oxidized by an ultraviolet/ozone exposure at room temperature and subsequently removed by an HF wet etch. In the present study, the compositional changes during depth profiling and the amount of silicon removed per oxidation/etch cycle were estimated by x-ray photoelectron spectroscopy. In addition, Rutherford backscattering spectroscopy was used to confirm the compositional changes and to measure defect depth distributions. Further, surface-charge spectroscopy was applied to determine the minimum oxidation/etching required to completely remove Fermi-level pinning associated with the residual damage. The results showed that these profiling and analysis techniques, when applied in a coherent manner, can provide an accurate picture of the residual damage induced by reactive ion etching. More importantly, the study also showed that the oxidation/etching technique can be applied as a well-controlled process for removing the residual damage.

English Descriptors: Experimental study; Measuring methods; Silicon; Etching; Plasma sources; Depth profiles; Crystal defects; Impurities;

Oxidation; Fermi level; RBS; Photoelectron spectroscopy; Reactive sputtering

French Descriptors: Etude experimentale; Methode mesure; 7920R; 8160C; 8280P; Silicium; Gravure; Source plasma; Profil profondeur; Defaut cristallin; Impurete; Oxydation; Niveau Fermi; RBS; Spectrometrie photoelectron; Pulverisation reactive

Classification Codes: 001B70I20R; 001B80A60C; 001C04C





3/5/18 (Item 6 from file: 144)
DIALOG(R)File 144: Pascal


04815085 PASCAL No.: 83-0059889

## Etching and dissolution mechanism of cadmium oxalate trihydrate crystals

ARORA S K; ABRAHAM T
Sardar patel univ., dep. physics, Gujarat, India

Journal: Cryst. res. technol. (1979), 1982, 17 (4) 489-495

ISSN: 0232-1300 Availability: CNRS-13690
No. of Refs.: 14 ref.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: German Democratic Republic
Language: English

Etude de l'attaque des dislocations et de la dissolution des cristaux du titre, obtenus par la methode du gel, en utilisant differents attaquants.
L'etude revele l'existence d'un reseau de dislocations dans le corps du cristal et de boucles de dislocation peu profondes dans la sous-structure.
La dissolution plus rapide du cristal aux temperatures elevees montre que la vitesse de dissolution dans l'etape initiale est tres inferieure pour augmenter rapidement ensuite et atteindre une valeur constante

English Descriptors: Chemical etching; Experimental study; Dislocation loop ; Carboxylate; Saturated aliphatic compound; Inorganic compound; Etch pit ; Gel growth; Substructure; Kinetics; Temperature; Cadmium Compounds; Mechanism; Transition metal Compounds; Dislocation; Inverse crystal growth; Organic salt

French Descriptors: Attaque chimique; Etude experimentale; Boucle

dislocation; Carboxylate; Compose aliphatique sature; Compose mineral;
Figure attaque; Methode gel; Sous structure; Cinetique; Temperature;
Cadmium Compose; Mecanisme; Metal transition Compose; Dislocation;
Decroissance cristalline; Sel organique; Cadmium oxalate,hydrate

Classification Codes: 161A13E



3/5/19 (Item 7 from file: 144)
DIALOG(R)File 144: Pascal

03829975 PASCAL No.: 82-0353139

# KINETICS OF ETCHING AND DISSOLUTION OF GEL-GROWN CDC SUB 2 O SUB 4 .3H SUB 2 O CRYSTALS

ARORA S K; ABRAHAM T
SARDAR PATEL UNIV., DEP. PHYS./VALLABH VIDYANAGAR 388120,INDIA
Journal: J. MATER. SCI., 1982
, 17 (6) 1723-1728

ISSN: 0022-2461 Availability: CNRS-12733
No. of Refs.: 11 REF.
Document Type: P (SERIAL) ; A (ANALYTIC)
Country of Publication: UNITED KINGDOM
Language: ENGLISH
CONTRAIREMENT A DE PRECEDENTES ETUDES, L'ENERGIE D'ACTIVATION DU
PROCESSUS D'EROSION DANS DES SOLVANTS POUR LEQUEL LE MECANISME DE
DISSOLUTION EST CONTROLE PAR REACTION CHIMIQUE EST INFERIEURE A CELLE POUR
LAQUELLE LE PROCESSUS DE DISSOLUTION EST CONTROLE PAR LA DIFFUSION DES
ESPECES CHIMIQUES

English Descriptors: INORGANIC COMPOUND; TRANSITION METAL COMPOUNDS;
SATURATED ALIPHATIC COMPOUND; CHEMICAL ETCHING; DISSOLUTION; KINETICS;
GEL METHOD; EXPERIMENTAL STUDY; INVERSE CRYSTAL GROWTH; ORGANIC SALT;
ETCHING; GEL GROWTH
English Generic Descriptors: CRYSTALLOGRAPHY

French Descriptors: COMPOSE MINERAL; METAL TRANSITION COMPOSE; COMPOSE
ALIPHATIQUE SATURE; ATTAQUE CHIMIQUE; DISSOLUTION; CINETIQUE; METHODE GEL
; ETUDE EXPERIMENTALE; DECROISSANCE CRISTALLINE; SEL ORGANIQUE; CADMIUM
OXALATE,HYDRATE
French Generic Descriptors: CRISTALLOGRAPHIE

Classification Codes: 161A09A

Dialog eLink: USPTO Full Text Retrieval Options
3/5/20 (Item 1 from file: 357)
DIALOG(R)File 357: Derwent Biotech Res.


0376179 **DBA Accession No.:** 2005-21885 **PATENT**
**Preparing cross-linked enzyme crystals of hydrolases and oxidoreductases which are solvent tolerant, thermostable and shear resistant by reacting the crystals of the enzyme with a multifunctional crosslinking agent glucoamylase, peroxidase, protease crystallization and lyophilization**

**Author:** ABRAHAM T E; BINDHU L V
**Patent Assignee:** COUNCIL SCI and IND RES SOUTH AFRICA 2005
**Patent Number:** WO 200566341 **Patent Date:** 20050721 **WPI Accession No.:** 2005-506871 ( 200551 )
**Priority Application Number:** WO 2004IN000002 **Application Date:** 20040101
**National Application Number:** WO 2004IN2 **Application Date:** 20040101
**Language:** English
**Abstract:** DERWENT ABSTRACT: NOVELTY - Preparing cross linked enzyme crystals of hydrolases and oxidoreductases which are solvent tolerant, thermostable and shear resistant comprises: (1) crystallizing the enzymes in aqueous buffer; (2) reacting the crystals of the enzyme with a multifunctional crosslinking agent; (3) washing the cross linked crystals with a reagent; and (4) coating cross linked protein crystals with a surfactant. DETAILED DESCRIPTION - Preparing cross linked enzyme crystals of hydrolases and oxidoreductases which are solvent tolerant, thermostable and shear resistant comprises: (1) crystallizing the enzymes in aqueous buffer with suitable salts and cosolvents in the presence of surfactants at a temperature ranging from 4degreesC to 10degreesC for a period ranging between 5 hrs to 15 days to obtain the crystals of the protein having a particle size ranging from 50 to 150 microns; (2) reacting the crystals of the enzyme obtained in step (1) with a multifunctional crosslinking agent in the presence of buffer of pH ranging from 3-8 at a temperature ranging from 4degreesC to 25degreesC to get the crossed linked enzyme crystal; (3) washing the cross linked crystals with a reagent that is capable of removing the excess of the multifunctional cross linking reagent so as to obtain the washed cross linked protein; and (4) coating cross linked protein crystals with a suitable surfactant, and lyophilizing them to obtain the stable product. An INDEPENDENT CLAIM is included for a process of continuous generation of glucose solution making use of the cross-linked enzyme crystal.BIOTECHNOLOGY - Preferred Method: Preparing cross linked enzyme crystals of hydrolases and oxidoreductases which are solvent tolerant, thermostable and shear resistant comprises: (1) crystallizing the enzymes in aqueous buffer with a suitable salts and cosolvents in the presence of

surfactants at a temperature ranging from 4degreesC to 10degreesC for a period ranging between 5 hrs to 15 days to obtain the crystals of the protein having a particle size ranging from 50 to 150 microns; (2) reacting the crystals of the enzyme obtained in step (1) with a multifunctional crosslinking agent in the presence of buffer of pH ranging from 3-8 at a temperature ranging from 4degreesC to 25degreesC to get the crossed linked enzyme crystal; (3) washing the cross linked crystals with a reagent that is capable of removing the excess of the multifunctional cross linking reagent so as to obtain the washed cross linked protein; and (4) coating cross linked protein crystals with a suitable surfactant, and lyophilizing them to obtain the stable product. The enzymes comprise hydrolases and the enzyme is a starch hydrolyzing amylase namely glucoamylase. The oxidoreductase enzyme is a plant peroxidase. The oxidase comprises the group of plant peroxidases consisting of Horseradish, Ipomea or Saccharum peroxidases. The crystallizing salt is sulphate of ammonium or sodium either as saturated solution or crystals. The buffer used for the cross-linked glucoamylase preparation is an aqueous buffer of 1OmM-0.5M of acetate having a pH of 4.5. The buffer used for the cross-linked peroxidase preparation is an aqueous buffer of 1OmM -0.5M phosphate or tris having pH of 6.5-8.0. The co-solvent is an alcohol having a concentration of 1-20%, example 2-methyl,2,4 pentane diol, 2-propanol, 1,5 pentane diol, ethanol, methanol or isoamyl alcohol. The crystal is a microcrystal of 150 microns or less. The cross linking reagent used is glutaraldehyde or starch dialdehyde. The surfactant used is anionic, non-ionic, or cationic. The cationic surfactant used is cetyl trimethyl ammonium bromide or cetrimide. The anionic surfactant used is dioctyl sulfosuccinate Aerosol OT. The non-ionic surfactant used is alkyl phenol ethoxylate, sorbitan trioleate, sorbitan tristerate, Examples Tween 20, Tween 80 or Triton X-IOO. The surfactant provides a weight ratio of crosslinked enzyme crystals to surfactant between about 1:1 and 1:5, preferably between about 1:1 and 1:2 and is in a lyophilized form. The cross-linked glucoamylase is active in 1:1 mixture of water organic solvents n-dodecane; n-hexane; chloroform; or dimethyl sulphoxide. The crosslinked enzyme crystal is having resistance to exogenous proteolysis, such that the crosslinked enzyme crystal retains at least 91% of its initial activity after incubation for three hours in the presence of a concentration of Protease that causes the soluble uncross linked form of the enzyme that is crystallized to form the enzyme crystal that is cross-linked to lose at least 94% of its initial activity under the same conditions, where the crystal is in lyophilized form. The cross-linked Peroxidases are active in organic solvents like toluene; 80% dioxane, chloroform; 2-propanol; chloroform; acetone; ethanol; acetonitrile; methanol; and dioxane. The crystals of plant peroxidase especially Horse radish peroxidase produces 2, 4 dimethyl phenol dimmer from monomer dissolved either in 2-propanol or toluene and the catalysis carried out at 50degreesC for 30 min in the presence of 30% H2O2. The process of continuous generation of glucose solution making use of the cross linked enzyme crystal comprises packing the cross linked glucoamylase crystals in a jacketed column for the continuous saccharification of starch solution having a concentration of 1-20%, preferably 4-10%(W/V) at pH 4.5 and at 60degreesC with a yield of 110g glucose/L/hour at a residence time of 7.6 min. The enzyme can also act upon a solution of l-30%(W/V) of maltodextrin of DE 10-15 preferably 10%(W/V) maltodextrin with a DE of 10-14 at a pH of 4.5, at 60degreesC thereby producing glucose solution within 1-8 min with a yield of 463 to 714 g/L/h. USE - The method is useful in preparing cross-linked enzyme crystals

of hydrolases and oxidoreductases which are solvent tolerant, thermostable and shear resistant (claimed).(44 pages)
**Descriptors:** hydrolase, oxidoreductase, glucoamylase, horseradish, Ipomea sp., Saccharum sp. peroxidase, protease crystal prep., crystallization, lyophilization thermostable enzyme EC-3.2.1.3 EC-1.11.1.7 plant Armoracia rusticana sugarcane grass (24, 35)
**Section:** BIOMANUFACTURING and BIOCATALYSIS-Biocatalyst Isolation and Characterization

3/5/21 (Item 1 from file: 434)
DIALOG(R)File 434: SciSearch(R) Cited Ref Sci


04761156 **Genuine Article#:** PM502 **Number of References:** 21
**Title: INDENTATION STUDY OF CADMIUM OXALATE TRIHYDRATE SINGLE-CRYSTALS**
**Author:** ARORA SK; ABRAHAM T; RAO GST; GODBOLE RS
**Corporate Source:** SARDAR PATEL UNIV,DEPT PHYS/VALLABH VIDYANAGAR 388120/GUJARAT/INDIA/
**Journal:** JOURNAL OF MATERIALS SCIENCE , 1982 , V 17 , N10 , P 2825-2830
**Language:** ENGLISH **Document Type:** ARTICLE
**Geographic Location:** INDIA
**Subfile:** SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth Sciences; CC ENGI--Current Contents, Engineering, Technology & Applied Sciences
**Journal Subject Category:** MATERIALS SCIENCE
**Descriptors:** SCI
**Cited References:**
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ARORA SK, 1982, V17, P489, CRYSTAL RES TECH
ARORA SK, 1981, V19, P199, INDIAN J PURE AP PHY
ARORA SK, 1981, V52, P851, J CRYSTAL GROWTH
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BRASEN D, 1976, V11, P791, J MATER SCI
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3/5/22 (Item 2 from file: 434)
DIALOG(R)File 434: SciSearch(R) Cited Ref Sci


04584778 **Genuine Article#:** NW655 **Number of References:** 11
**Title: KINETICS OF ETCHING AND DISSOLUTION OF GEL-GROWN CDC2O4-3H2O CRYSTALS**
**Author:** ARORA SK; ABRAHAM T
**Corporate Source:** SARDAR PATEL UNIV,DEPT PHYS/VALLABH VIDYANAGAR 388120/GUJARAT/INDIA/
**Journal:** JOURNAL OF MATERIALS SCIENCE , 1982 , V 17 , N6 , P 1723-1728
**Language:** ENGLISH **Document Type:** ARTICLE
**Geographic Location:** INDIA
**Subfile:** SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth Sciences; CC ENGI--Current Contents, Engineering, Technology & Applied Sciences
**Journal Subject Category:** MATERIALS SCIENCE
**Descriptors:** SCI
**Cited References:**

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3/5/23 (Item 3 from file: 434)
DIALOG(R)File 434: SciSearch(R) Cited Ref Sci


03891564 **Genuine Article#:** LP587 **Number of References:** 5
**Title: CONTROLLED NUCLEATION OF CADMIUM OXALATE IN SILICA HYDROGEL AND CHARACTERIZATION OF GROWN CRYSTALS**
**Author:** ARORA SK; ABRAHAM T
**Corporate Source:** SARDAR PATEL UNIV,DEPT PHYS/VALLABH

VIDYANAGAR 388120/GUJARAT/INDIA/
**Journal:** JOURNAL OF CRYSTAL GROWTH , 1981 , V 52 , APR , P 851-857
**Language:** ENGLISH **Document Type:** ARTICLE
**Geographic Location:** INDIA
**Subfile:** SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth Sciences
**Journal Subject Category:** CRYSTALLOGRAPHY
**Descriptors:** SCI
**Cited References:**
BRIDLE C, 1965, V19, P483, ACTA CRYSTALLOGR DEN
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3/5/24 (Item 4 from file: 434)
DIALOG(R)File 434: SciSearch(R) Cited Ref Sci


03826669 **Genuine Article#:** LJ563 **Number of References:** 4
**Title: CONTROLLED NUCLEATION AND GROWTH OF CADMIUM OXALATE TRIHYDRATE CRYSTALS IN SILICA HYDROGEL**
**Author:** ARORA SK; ABRAHAM T
**Corporate Source:** SARDAR PATEL UNIV,DEPT PHYS/VALLABH VIDYANAGAR 388120/GUJARAT/INDIA/
**Journal:** INDIAN JOURNAL OF PURE & APPLIED PHYSICS , 1981 , V 19 , N3 , P 199-203
**Language:** ENGLISH **Document Type:** ARTICLE
**Geographic Location:** INDIA
**Subfile:** SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth Sciences
**Journal Subject Category:** PHYSICS
**Descriptors:** SCI
**Cited References:**
BRIDLE C, 1965, V19, P483, ACTA CRYSTALLOGR DEN
DENNIS J, 1967, V114, P263, J ELECTROCHEM SOC
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? **e au=bindhu l**

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Ref    Items   Index-term
E1         1   AU=BINDHU KR
E2         0  *AU=BINDHU L
E3         4   AU=BINDHU L V
E4         3   AU=BINDHU L.B.V.
E5         2   AU=BINDHU L.V.
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E6         1  AU=BINDHU LAXMI BAI VASANTHAKUMARI
E7         1  AU=BINDHU LAXMI BAI VASANTHAKUMARL
E8         2  AU=BINDHU LBV
E9         2  AU=BINDHU LV
E10        2  AU=BINDHU M.

Enter P or PAGE for more
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? **s e3 or e9 or e5**

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               4  AU=BINDHU L V
               2  AU=BINDHU LV
               2  AU=BINDHU L.V.
      S4       8  AU='BINDHU L V' OR AU='BINDHU LV' OR AU='BINDHU L.V.'
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? **rd**

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>>>Duplicate detection is not supported for File 391.

>>>Records from unsupported files will be retained in the RD set.
      S5       4  RD  (unique items)
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? **ds**

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Set     Items   Description
S1        522   AU='ABRAHAM T' OR AU='ABRAHAM T E' OR AU='ABRAHAM T
EMILIA'
S2         32   S1 AND CRYSTAL?
S3         24   RD  (unique items)
S4          8   AU='BINDHU L V' OR AU='BINDHU LV' OR AU='BINDHU L.V.'
S5          4   RD  (unique items)
```

? **s s5 not s3**

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               4  S5
              24  S3
      S6       3  S5 NOT S3
```

? **t s6/5/all**

**Dialog eLink:** USPTO Full Text Retrieval Options

6/5/1 (Item 1 from file: 34)
DIALOG(R)File 34: SciSearch(R) Cited Ref Sci


11655145 **Genuine Article#:** 681EJ **Number of References:** 39
**Title: Preparation and kinetic studies of surfactant-horseradish peroxidase ion paired complex in organic media**
**Author:** Bindhu LV; Abraham TE (REPRINT)
**Corporate Source:** CSIR,Reg Res Lab, Biochem Proc & Wastewater Technol Div,Trivandrum 695019/Kerala/India/ (REPRINT); CSIR,Reg Res Lab, Biochem Proc & Wastewater Technol Div,Trivandrum 695019/Kerala/India/

**Journal:** BIOCHEMICAL ENGINEERING JOURNAL , 2003 , V 15 , N1 ( JUL ) , P 47-57
**ISSN:** 1369-703X **Publication Date:** 20030700
**Publisher:** ELSEVIER SCIENCE SA , PO BOX 564, 1001 LAUSANNE, SWITZERLAND
**Language:** English **Document Type:** ARTICLE
**Geographic Location:** India
**Journal Subject Category:** BIOTECHNOLOGY & APPLIED MICROBIOLOGY; ENGINEERING, CHEMICAL
**Abstract:** Horseradish peroxidase was solubilized in organic medium using the technique of ion pairing with the anionic surfactant Aerosol OT (AOT). System parameters like surfactant concentration, pH, ionic strength of the aqueous phase, cosolvent concentration etc. were found to influence the solubilization of HRP. Kinetic behaviour of the ion paired complex towards oxidation of o-phenylenediamine (OPD) in three different solvent systems-aqueous, aqueous-organic monophasic and aqueous-organic biphasic system was investigated. Steady state kinetics of ion paired HRP revealed that ion pairing of the enzyme with the surfactant resulted in an increase in the apparent K-m and a decrease in V-max values of the enzyme in aqueous medium. Enzyme-substrate affinity (K-m) showed an improvement for the ion paired enzyme in organic solvents and was found to decrease with increase in hydrophobicity of the solvent with the ion paired enzyme exhibiting the least K-m value in the most hydrophobic solvent toluene. There was an eightfold decrease in Km value in toluene compared to that in aqueous medium. Among the two types of non-aqueous systems used for the study, V-max was found to be higher in the microaqueous system (toluene). Ion paired HRP exhibited very high catalytic efficiency (K-cat/K-m) in toluene compared to that of native HRP. (C) 2002 Elsevier Science B.V. All rights reserved.
**Descriptors:** SCIAuthor Keywords: enzyme biocatalysis ; enzyme activity ; horseradish peroxidase ; solubilization ; enzyme technology
**Identifiers:** KeyWord Plus(R): ENZYMATIC CATALYSIS; REVERSE MICELLES; PROTEIN EXTRACTION; AEROSOL OT; SOLVENTS; ENZYMES; WATER; OPTIMIZATION; CHYMOTRYPSIN; SYSTEMS
**Cited References:**
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KLIBANOV AM, 1989, V14, P141, TRENDS BIOCHEM SCI
LAANE C, 1987, V30, P81, BIOTECHNOL BIOENG
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RYU K, 1989, V111, P8026, J AM CHEM SOC
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6/5/2 (Item 2 from file: 34)
DIALOG(R)File 34: SciSearch(R) Cited Ref Sci


11430710 **Genuine Article#:** 649XT **Number of References:** 46
**Title: Immobilization of horseradish peroxidase on chitosan for use in nonaqueous media**
**Author:** Bindhu LV; Abraham ET (REPRINT)
**Corporate Source:** CSIR,Reg Res Lab, Biochem Proc Div,Ind Estate PO Pappanam Code/Trivandrum 695019/Kerala/India/ (REPRINT); CSIR,Reg Res Lab, Biochem Proc Div,Trivandrum 695019/Kerala/India/
**Journal:** JOURNAL OF APPLIED POLYMER SCIENCE , 2003 , V 88 , N6 ( MAY 9 ) , P 1456-1464
**ISSN:** 0021-8995 **Publication Date:** 20030509
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**Abstract:** Chitosan, a natural polysaccharide, was used for the covalent immobilization of horseradish peroxidase, an enzyme of high synthetic utility, with the carbodiimide method. Of the enzyme, 62% was immobilized on chitosan when 1-ethyl-3-(3-dimethylaminopropyl carbodiimide) was used as the peptide coupling agent. The influence of different parameters, such as the enzyme concentration, carbodiimide concentration, and incubation period, on the activity retention of the immobilized enzyme was investigated. Kinetic studies using horseradish peroxidase immobilized on chitosan revealed the effects of several parameters, such as the substrate hydrophilicity and hydrophobicity, the solubility of substrates in the medium, the solvent hydrophobicity, and the support aquaphilicity, on the catalytic activity of the immobilized enzyme in nonaqueous media. General rules for the optimization of solvents for nonaqueous enzymology based on the partitioning of the solvent were not applicable for the immobilized horseradish peroxidase. The catalytic efficiency was greatest when o-phenylene diamine was used as the substrate and least when guaiacol was used. The aquaphilicity of the support played an important role in the kinetics of the immobilized horseradish peroxidase in water-miscible solvents. The results were promising for the future development of chitosan-immobilized enzymes for use in organic media. (C) 2003 Wiley Periodicals, Inc.
**Descriptors:** SCIAuthor Keywords: enzymes ; catalysis ; supports
**Identifiers:** KeyWord Plus(R): ORGANIC-SOLVENTS; HYDROGEN-PEROXIDE; ALPHA-CHYMOTRYPSIN; ASPERGILLUS-NIGER; ENZYME; WATER; BEADS; POLYPHENOL; STABILITY; BIOSENSOR
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6/5/3 (Item 1 from file: 357)
DIALOG(R)File 357: Derwent Biotech Res.


0398740 **DBA Accession No.:** 2006-12236 **PATENT**

**Preparation of cross linked protein crystals crosslinked enzyme immobilization for use in biosensor and bioremediation**

**Author:** THOLATH A E; BINDHU L V
**Patent Assignee:** COUNCIL SCI and IND RES INDIA 2006
**Patent Number:** IN 200300013 **Patent Date:** 20060210 **WPI Accession No.:** 2006-296343 ( 200631 )
**Priority Application Number:** IN 204N-DE00013 **Application Date:** 20040102
**National Application Number:** IN 2004DE13 **Application Date:** 20040102
**Language:** English
**Abstract:** DERWENT ABSTRACT: NOVELTY - A protein such as an enzyme is immobilized by crosslinking crystals of the protein with a multifunctional crosslinking agent. The crosslinked protein crystals may be lyophilized for storage. A preferred protein is an enzyme such as amyloglucosidase, Horseradish peroxidase, plant

peroxidases etc. Crosslinked enzyme crystals preferably retain at least 90% activity after incubation for three hours in the presence of a concentration of protease that causes the soluble uncrosslinked form of the enzyme to lose at least 92% of its initial activity under the same conditions. Enzyme crystals that are crosslinked may be microcrystals having a cross-section of 100 microns or less. Crosslinked enzyme crystals are sturdy and can withstand harsh conditions and may be used for performing selective chemical reactions in organic or aqueous medium, in an assay, diagnostic kit or biosensor for detecting an analyte, in production of a product such as using crosslinked peroxidase crystals to produce novel polymers, biotransformation including those used in industrial scale chemical processes and in environmental remediations. Image 0/0

**Descriptors:** amyloglucosidase, horseradish peroxidase protein immobilization, crosslinking crystal, agent, appl. chemical reaction, diagnostic kit, biosensor, polymer prep., biotransformation, bioremediation plant Armoracia rusticana enzyme EC-1.11.1.7 analysis (25, 22)

**Section:** BIOMANUFACTURING and BIOCATALYSIS-Biocatalyst Application-BIOINFORMATICS and ANALYSIS-Biosensors; WASTE-DISPOSAL AND BIOREMEDIATION-Environmental Biotechnology-DIAGNOSTICS-Molecular Diagnostics; OTHER CHEMICALS-Polymers

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S2         32   S1 AND CRYSTAL?
S3         24   RD  (unique items)
S4          8   AU='BINDHU L V' OR AU='BINDHU LV' OR AU='BINDHU L.V.'
S5          4   RD  (unique items)
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